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Dexamethasone Impregnated Contact Lenses in the Treatment of Post-PRK Inflammation in a Rabbit Model

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Introduction: Many conditions can lead to ophthalmic inflammation, which can become painful and blinding. Steroid eye drops are the most common treatment and compliance is often a complicating issue. In attempts to alleviate compliance errors, experimental contact lenses impregnated with steroids are now being produced. This study is investigating an experimental dexamethasone-eluting contact lens.

Methods: Thirty-five New Zealand White rabbits were approved for use in the technique development stage and in four different study arms. The technique development stage had different refractive surgery procedures, tarsorrhaphy configurations, and nictitating membrane configurations to determine the best surgical combination for study results. The first study arm included the experimental contact lens replaced weekly, a second arm with a bandage contact lens replaced weekly, a third arm with a bandage contact lens only the first week, and a fourth arm with no bandage contact lens at any point. The non-experimental contact lens arms received dexamethasone drops. The left eye served as control.

Results: Results of the full study are pending. The technique development stage revealed that a lateral permanent tarsorrhaphy, a bolstered temporary tarsorrhaphy, a single central tarsorrhaphy, and no tarsorrhaphy were all insufficient to retain a contact lens in the rabbit model. It was also found that 30 seconds of an alcohol epithelium removal was unsuccessful in this model.

Conclusion: In the rabbit model to test a steroid impregnated contact lens, the combination most successful in our study involved leaving the nictitating membrane intact, performing a laser assisted epithelium removal, and placing 2 spaced temporary tarsorrhaphy sutures without bolsters that could be taken down and completely replaced every week.

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Conflict of Interest: None of the authors have a conflict of interest to declare.

“The experiments reported herein were conducted according to the principles set forth in the National Institute of Health Publication No. 80-23, Guide for the Care and Use of Laboratory Animals and the Animal Welfare Act of 1966, as amended.”